National Elk Refuge Biological Update 20 January 2017

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Supplemental Feeding Began for Season on January 7
Supplemental feeding operations for elk and bison began on 7 January 2017, two and a half weeks earlier than the 10-year average start date of 24 January. Although feeding was initiated much earlier than the average date, there is considerable annual variability in feeding start date , which is dependent on snow and forage conditions (10-year range of feeding start dates January 5 to February 12). An earlier than average feeding start date this year was associated with above average snow depth, dense snow conditions associated with a rain event in mid-December, higher than average elk numbers on NER during the late December to early January time period, and small numbers of elk leaving the refuge for private land in Spring Gulch. Preventing elk co-mingling with livestock on private lands is one of the principal goals of the NER supplemental feeding program.

WGFD biologist Aly Courtemanch and I cooperatively monitor snow and forage conditions to determine when supplemental feeding is necessary. The recommendation to begin supplemental feeding is based on criteria that are mutually agreed upon between the Refuge and Wyoming Game and Fish Department. These criteria entail that when average available forage declines to 300 lbs per acre at key index sites, supplemental feeding is typically warranted, but feeding start date can also be influenced by elk behavior or other factors. This season we monitored conditions on 24 and 28 December 2016, and 2 and 4 January 2017. Average available forage declined from 775 lbs per acre on the first visit to 465 lbs per acre on January 4. Given the rate of decline in available forage and movements of small groups of elk from the refuge to the Spring Gulch area, we recommended that supplemental feeding begin on 7 January 2017. NER and WGFD managers agreed with this recommendation.

Preliminary estimates suggest that we have been feeding approximately 7,000 to 8,500 elk and 400-500 bison, but estimates of animal numbers are typically poor during the early weeks of the feeding season. The most accurate

estimates of winter elk and bison numbers on NER will occur during the annual classification counts that are held in collaboration with Wyoming Game and Fish Department in February. Please stay tuned for those results.

Chronic Wasting Disease and the Jackson Elk Herd

Chronic Wasting Disease (CWD) is a contagious, always fatal disease that affects deer, elk, and moose. The disease is caused caused by a prion, which are a protein that has the ability to change the shape of other proteins in the brain, which over time leads to emaciation, neurological impairment, and death. The disease can be transmitted via animal to animal contact and also from prions that exist in the environment, but the relative importance of these routes of transmission are unknown. Animals infected with CWD and the carcasses of animals that died from CWD shed prions into the environment. Once in the environment, prions are a potential source of infection. There is significant evidence to suggest that the prions that cause CWD are very persistent in soil and could remain infectious in the environment for many years. Research and observations suggest that CWD may have greater impacts on elk in relatively high density situations or where environmental contamination may occur in a smaller area, such as those found on NER feedgrounds.

WGFD and other agencies have been intensively sampling the Jackson elk herd annually for CWD since 2008 (sampling >2% of total estimated elk population each year) and there is no evidence to suggest that CWD is currently present in the Jackson elk herd. However, there is considerable evidence that the CWD endemic area has been expanding closer to Jackson Hole. CWD has been detected in mule deer in areas within 35 miles of NER and in elk within 160 miles. There is no way to know with confidence when elk in the Jackson elk herd will be infected with CWD, but based on the available evidence I believe that initial infection of elk in the Jackson elk herd is inevitable and possible at any time.

Using population data specific to the Jackson elk herd, we recently completed a modelling exercise that estimates the predicted prevalence of CWD and the effects of the disease on population growth rate. It is important to note that these predictions are based on a potential invasion of the disease, and there is currently no evidence that CWD is present in the Jackson elk herd. In the absence of hunting, the model predicts that the population will decline when CWD prevalence reaches 7% in adult and yearling cow elk (95% Bayesian credible interval, BCI: 0%-23% prevalence). However, when current cow elk harvest levels are included as a source of mortality in the population, the model predicts that the Jackson elk population will decline at any level of CWD prevalence. Prior research in Rocky National Park showed infection probability of cow elk averaged 8% (95% credible interval = .05 - .12). This average infection rate and its associated uncertainty were used as a prior distribution to forecast the effect of the introduction of 5 elk with CWD into the Jackson population. Forecasts included a wide range of CWD prevalence rates after 5 years (median = 10%, 95% Bayesian credible interval = 6% - 16%). The prior distribution of infection rates has a large effect on model outcomes. Because the infection rate is based on Rocky Mountain National Park data and does not vary over time, the model likely overestimates prevalence in the early years following introduction of CWD, and underestimates the effects of the disease later on when both infected animals and CWD prions become more common in the environment. A full PDF copy of the report "Model Forecasting of the Impacts of CWD on the Jackson Elk Herd." is available via my ResearchGate site https://www.**researchgate**.net/profile/**Eric_Cole**4/publications or via email attachment upon request.

The following paragraph is my professional opinion based on available evidence, and does not necessarily reflect the views of the US Fish and Wildlife Service or any co-authors of "Model Forecasting of the Impacts of CWD on the Jackson Elk Herd": Although the exact time frame is unclear, introduction of CWD into the Jackson elk herd appears inevitable and could occur at any time. Population modeling predicts a wide range of CWD prevalence and effects on Jackson elk herd population growth rates in the short term (within 5 years) following introduction of the disease, but in the long term the effects of CWD on the health of the Jackson elk herd and recreational opportunities dependent on the Jackson elk herd will likely be significant and negative. For example at any level of CWD prevalence, current levels of cow elk harvest could not be sustained. The current supplemental feeding regime will exacerbate the effects of CWD on the Jackson Elk Herd because elk density at NER far exceeds elk density reported at Rocky Mountain National Park, which was the source of the annual infection rate used in the model. Elk are fed on the same 5,000 acres of NER each year, and given the persistence of CWD prions in the environment, these areas will likely become heavily contaminated with the CWD prion over time if status quo management continues. 60-80% of the Jackson elk herd use NER feedgrounds each winter, which will regularly expose these elk to CWD prions at these sites. Various elk migration studies and research on another disease prevalent on NER, (brucellosis), suggest that the current feeding regime and its associated high concentrations of elk could be a source of CWD infection for cervids throughout the Greater Yellowstone Ecosystem.

Pronghorn

82 Pronghorn were observed by biotech Tim Pratt in the vicinity of Miller Butte on 8 January 2017, down from a high count of 180 in early December 2016. WGFD biologist Jill Randall in Pinedale reported that some pronghorn were migrating late via the Upper Green River Basin around mid-December. It is possible that some of the 180 pronghorn observed on NER successfully migrated out of the valley in mid-December. I have received no reports of pronghorn wintering in Jackson Hole, other than those currently wintering on NER.

Wolves:

I observed 13 wolves in the Poverty Flats/Chambers areas of NER (approximately 1 mile northeast of Miller Butte) on 17 January 2017. These wolves were are most likely the remaining members of the Pinnacle Peak Pack joined by a small

number of new wolves from other areas.

Other Wildlife Observations
I have regularly observed a great gray owl in the area northeast of Miller Butte since late December. Previously there were large numbers of Rough-legged hawks using the refuge in late December, but far fewer have been observed the past 2 weeks. I probably don't need to tell anyone this, but Spring seems a long way off.

Thanks to everyone for their interest in these updates. Feel free to contact me if you have any questions.

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